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ABSTRACT

This document contains Illinois Occupational Skill Standards for occupations in the Information Technology Operate Cluster (help desk support, computer maintenance and technical support technician, systems operator, application and computer support specialist, systems administrator, network administrator, and database administrator). The skill standards define what an individual should know and the expected level of performance required in an occupational setting. The standards focus on the most critical work performances for an occupation or occupational area. Each skill standard contains the following components: performance area, performance skill, skill standard, performance elements, and performance assessment criteria. Following an introduction that explains the standards and their components and includes a performance skill-level matrix, the document contains skill standards for the following areas: (1) monitoring; (2) administration; (3) change management; (4) operations; (5) maintenance; (6) task management; and (7) troubleshooting. Six appendixes include glossaries of information technology operation terms and occupational skill standards terms; lists of members of the Illinois Occupational Skill Standards and Credentialing Council, the Communications Subcouncil, and the Information Technology Operate Cluster Standards Development Committee; and workplace skills standards. (KC)

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ILLINOIS

OCCUPATIONAL SKILL STANDARDS

INFORMATION TECHNOLOGY OPERATE CLUSTER

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ILLINOIS OCCUPATIONAL SKILL STANDARDS
INFORMATION TECHNOLOGY OPERATE CLUSTER

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ILLINOIS OCCUPATIONAL SKILL STANDARDS

INFORMATION TECHNOLOGY OPERATE CLUSTER

Endorsed for Illinois
by the
Illinois Occupational Skill Standards
and Credentialing Council

A MESSAGE FROM THE ILLINOIS OCCUPATIONAL SKILL STANDARDS AND CREDENTIALING COUNCIL

Preparing youth and adults to enter the workforce and to be able to contribute to society throughout their lives is critical to the economy of Illinois. Public and private interest in establishing national and state systems of industry-driven skill standards and credentials is growing in the United States, especially for occupations that require less than a four-year college degree. This interest stems from the understanding that the United States will increasingly compete internationally and the need to increase the skills and productivity of the front-line workforce. The major purpose of skill standards is to promote education and training investment and ensure that this education and training enables students and workers to meet industry standards that are benchmarked to our major international competitors.

The Illinois Occupational Skill Standards and Credentialing Council (IOSSCC) has been working with industry subcouncils, the Illinois State Board of Education and other partnering agencies to adopt, adapt and/or develop skill standards for high-demand occupations. Skill standards products are being developed for a myriad of industries, occupational clusters and occupations. This document represents the collaborative effort of the Communications Subcouncil, and the Information Technology Operate Cluster Standards Development Committee.

These skill standards will serve as a guide to workforce preparation program providers in defining content for their programs and to employers to establish the skills and standards necessary for job acquisition. These standards will also serve as a mechanism for communication among education, business, industry and labor.

We encourage you to review these standards and share your comments. This effort has involved a great many people from business, industry and labor. Comments regarding their usefulness in curriculum and assessment design, as well as your needs for in-service and technical assistance in their implementation are critical to our efforts to move forward and improve the documents.

Questions concerning this document may be directed to:

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We look forward to your comments.

Sincerely,

The Members of the IOSSCC

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THE ILLINOIS PERSPECTIVE

The Occupational Skill Standards Act (PA 87-1210) established the nine-member Illinois Occupational Skill Standards and Credentialing Council (IOSSCC). Members of the IOSSCC represent business, industry and labor and are appointed by the Governor or State Superintendent of Education. The IOSSCC, working with the Illinois State Board of Education, Illinois Community College Board, Illinois Board of Higher Education, Illinois Department of Employment Security and Illinois Department of Commerce and Community Affairs, has created a common vision for workforce development in Illinois.

VISION

It is the vision of the IOSSCC to develop a statewide system of industry defined and recognized skill standards and credentials for all major skilled occupations providing strong employment and earnings opportunities in Illinois.

The IOSSCC endorses occupational skill standards and credentialing systems for occupations that

- require basic workplace skills and technical training,
- provide a large number of jobs with either moderate or high earnings, and
- provide career advancement opportunities to related occupations with moderate or high earnings.

Subcouncils and Standards Development Committees

Under the direction of the IOSSCC, and in cooperation with industry organizations and associations, industry subcouncils have been formed to review, approve and promote occupational skill standards and credentialing systems. The industry subcouncils are: Agriculture and Natural Resources; Applied Science and Engineering;* Business and Administrative Information Services; Communications; Construction;* Education and Training Services;* Energy and Utilities;* Financial Services; Health and Social Services; Hospitality; Legal and Protective Services;* Manufacturing; Marketing and Retail Trade; and Transportation, Distribution and Logistics. (*Indicates subcouncils identified for future development.)

Standards development committees are composed of business, labor and education representatives who are experts in the related occupational cluster. They work with the product developer to

- develop or validate occupational skill standards,
- identify related academic skills,
- develop or review assessment or credentialing approaches, and
- recommend endorsement of the standards and credentialing system to the industry subcouncil.

Expected Benefits

The intent of skill standards and credentialing systems is to promote education and training investment and ensure that students and workers are trained to meet industry standards that are benchmarked to the state's major international competitors. Skill standards and credentialing systems have major benefits that impact students and workers, employers and educators in Illinois.

Student and Worker Benefits

- Help workers make better decisions about the training they need to advance their careers
- Allow workers to communicate more effectively to employers what they know and can do
- Improve long-term employability by helping workers move more easily among work roles
- Enable workers to help their children make effective academic and career and technical decisions

Employer Benefits

- Focus the investment in training and reduce training costs
- Boost quality and productivity and create a more flexible workforce
- Improve employee retention
- Improve supplier performance
- Enlarge the pool of skilled workers

Educator Benefits

- Keep abreast of a rapidly changing workplace
- Contribute to curriculum and program development
- Provide students with better career advice
- Strengthen the relationship between schools and local businesses
- Communicate with parents because educators have up-to-date information about industry needs

The IOSSCC is currently working with the Illinois State Board of Education and other state agencies to integrate the occupational standards with the Illinois Learning Standards which describe what students should know and be able to do as a result of their education. The IOSSCC is also working to integrate workplace skills—problem solving, critical thinking, teamwork, etc.—with both the Illinois Learning Standards and the Illinois Occupational Skill Standards.

IOSSCC Requirements for Occupational Skill Standards

Illinois Occupational Skill Standards define what an individual should know and the expected level of performance required in an occupational setting. The standards focus on the most critical work performances for an occupation or occupational area.

Endorsed Occupations

Any occupational skill standards and credentialing system seeking IOSSCC endorsement must

- represent an occupation or occupational cluster that meets the criteria for IOSSCC endorsement, including economic development, earnings potential and job outlook;
- address both content and performance standards for critical work functions and activities for an occupation or occupational area;
- ensure formal validation and endorsement by a representative group of employers and workers within an industry;
- provide for review, modification and revalidation by an industry group a minimum of once every five years;
- award credentials based on assessment approaches that are supported and endorsed by the industry and consistent with nationally recognized guidelines for validity and reliability;
- provide widespread access and information to the general public in Illinois; and
- include marketing and promotion by the industry in cooperation with the partner state agencies.

Recognized Occupations

Occupations that do not meet the earnings criteria for IOSSCC endorsement but are part of an occupational cluster that is being developed may be presented for recognition by the IOSSCC. IOSSCC members encourage individuals to pursue occupational opportunities identified as endorsed occupations. Examples of occupations that do not meet the endorsement criteria, but have been recognized by the IOSSCC are Certified Nurse Assistant and Physical Therapy Aide.

Skill Standards Components

Illinois Occupational Skill Standards must contain the following components:

- Performance Area
- Performance Skill
- Skill Standard
- Performance Elements
- Performance Assessment Criteria

The IOSSCC further identified three components (*Conditions of Performance, Work to be Performed and Performance Criteria)* of the Skill Standard component as critical work functions for an occupation or industry/occupational area. The sample format for Illinois Occupational Skill Standards on the following page provides a description of each component of an occupational skill standard.

The sample format also illustrates the coding at the top of each page identifying the state, fiscal year in which standards were endorsed, Subcouncil abbreviation, cluster abbreviation and standard number. For example, the twenty-fifth skill standard in the Information Technology Operate Cluster, which has been developed by the Communications Subcouncil, would carry the following coding: IL.02.COMM.IT/OPER.25.

SUMMARY OF WORK TO BE PERFORMED. SUMMARY IS BRIEF AND BEGINS WITH AN ACTION VERB.

IL.FY.SUBCOUNCIL. CLUSTER. STANDARD NO.

PERFORMANCE AREA

SKILL STANDARD

CONDITIONS OF PERFORMANCE

A comprehensive listing of the information, tools, equipment and other resources provided to the person(s) performing the work.

WORK TO BE PERFORMED

An overview of the work to be performed in demonstrating the performance skill standard. This overview should address the major components of the performance. The detailed elements or steps of the performance are listed under "Performance Elements."

PERFORMANCE CRITERIA

The assessment criteria used to evaluate whether the performance meets the standard. Performance criteria specify product/outcome characteristics (e.g., accuracy levels, appearance, results, etc.) and process or procedure requirements (e.g., safety requirements, time requirements, etc.).

PERFORMANCE ELEMENTS

Description of the major elements or steps of the overall performance and any special assessment criteria associated with each element.

PERFORMANCE ASSESSMENT CRITERIA

Listing of required testing, certification and/or licensing.

Product and process used to evaluate the performance of the standard.

PRODUCT

Description of the product resulting from the performance of the skill standard.

PROCESS

Listing of steps from the Performance Elements which must be performed or the required order or performance for meeting the standard.

OCCUPATIONAL EARNINGS AND EMPLOYMENT INFORMATION FOR INFORMATION TECHNOLOGY OPERATE CLUSTER

I. Developmental Process and Occupational Definition

A. Developmental Process

After reviewing the current labor market information, the Communications Subcouncil recommended the development of skill standards for Information Technology. The Subcouncil evaluated initial occupational project work and determined that two separate projects should be completed: one for "Operate" and one for "Design/Build". The identified occupations meet the criteria established by the Illinois Occupational Skill Standards and Credentialing Council (IOSSCC) for performance skill standard development, including education and training requirements, employment and earnings opportunities. A product developer knowledgeable about Information Technology began the process of performance skill identification. The product developer prepared an outline and framework designed to address the major skills expected in the workplace. The framework addresses skill requirements common to the creation and installation of systems hardware and software.

The subcouncil recommended that the final skill standards product be presented to the IOSSCC. The IOSSCC reviewed the skill standards and met with the product developer, state liaison and chair of the subcouncil. Based on the review, the IOSSCC voted to endorse the occupations within the Information Technology Cluster Skill Standards.

1. Resources

Resources used include job descriptions from the *Dictionary of Occupational Titles; Bureau of Labor Statistics Standard Occupational Classification;* acinet.org; CareerJournal.com; the ABI database; and Salary.com.

2. Standards Development Committee

The Standards Development Committee was composed of workers from all levels within the Information Technology Cluster. The framework and initial outline of performance skills were addressed and reviewed at an initial meeting. During this time the work titles and skill matrix were accepted and the skills standards were reviewed and revisions suggested. Additional meetings took place and the skills standards, occupational titles and matrix were reviewed and then accepted by the Standards Development Committee. The Communications Subcouncil reviewed and approved the cluster.

B. Occupational Definition

Information technology (IT) workers are not unique to software and high technology firms; they are as common in the general workplace as in technology-based organizations. The following definition is taken from John Viulami's book, *The World of Information Technology*: "IT encompasses all the technologies used for creating, abstracting, visualizing, presenting, collaborating, communicating, and otherwise 'managing' the flow of information." IT workers are needed for knowledge-based work in all areas of work in companies and organizations involved in every kind of product and service. IT workers are involved in careers such as manufacturing, sales, customer service, and product development and are found in organizations ranging from high-tech industries, such as software development and biotechnology, to service industries, such as banking and insurance.

1. **Help Desk Support**

   Provides support to end users on a variety of issues. Identifies, researches and resolves technical problems. Responds to telephone calls, email and personnel requests for technical support. Tracks and monitors the problem to ensure a timely resolution. May require an associate's degree in a related area and 0-2 years of experience in the field or in a related area. Has knowledge of commonly used concepts, practices and procedures within a particular field. Relies on instructions and pre-established guidelines to perform the functions of the job. Works under immediate supervision and typically reports to a supervisor or manager.

2. **Computer Maintenance/Technical Support Technician**

   Maintains, analyzes, troubleshoots and repairs computer systems, hardware and computer peripherals. Documents, maintains, upgrades or replaces hardware and software systems. Supports and maintains user account information including rights, security and systems groups. May require an associate's degree or its equivalent and 0-3 years of experience in the field or in a related area. Has knowledge of commonly used concepts, practices and procedures within a particular field. Relies on instructions and pre-established guidelines to perform the functions of the job. Works under immediate supervision and typically reports to a project leader or manager.

3. **System Operator**

   Reviews, analyzes and modifies programming systems including encoding, testing, debugging and installing to support an organization's application systems. Consults with users to identify current operating procedures and to clarify program objectives. May require an associate's degree in a related area and 0-3 years of experience in the field or in a related area. Has knowledge of commonly used concepts, practices and procedures within a particular field. Relies on instructions and pre-established guidelines to perform the functions of the job. Works under immediate supervision. Typically reports to a project leader or manager.

4. **Application/Computer Support Specialist**

   Reviews, analyzes and evaluates information technology systems operations. May require an associate's degree in a related area and 0-3 years of experience in the field or in a related area. Has knowledge of commonly used concepts, practices and procedures within a particular field. Relies on instructions and pre-established guidelines to perform the functions of the job. Works under immediate supervision and typically reports to a project leader or manager.

5. **Systems Administrator**

   Installs new software releases and system upgrades, evaluates and installs patches and resolves software related problems. Performs system backups and recovery. Maintains data files and monitors system configuration to ensure data integrity. May require a bachelor's degree in a related area with at least two years of experience in the field or in a related area. Has knowledge of commonly used concepts, practices and procedures within a particular field. Relies on instructions and pre-established guidelines to perform the functions of the job. Works under immediate supervision and typically reports to a project leader or manager.

6. **Network Administrator**

   Installs, configures and maintains organization's network. Builds networks, maintains external and internal web presence, administers the networks. Performs system backups on its internal and external web network servers. Designs and supports server system(s) and supporting software. May require a bachelor's degree

in a related area and 0-2 years of experience in the field or in a related area. Has knowledge of commonly used concepts, practices and procedures within a particular field. Relies on instructions and pre-established guidelines to perform the functions of the job. Works under immediate supervision and typically reports to a project leader or manager.

7. **Database Administrator**

Administers, maintains, develops and implements policies and procedures for ensuring the security and integrity of the company database. Implements data models and database designs, data access and table maintenance codes, resolves database performance issues, database capacity issues, replication, and other distributed data issues. May require a bachelor's degree in a related area and/or 2-4 years of experience in the field or in a related area. Must be familiar with standard concepts, practices, and procedures within a particular field. Relies on limited experience and judgment to plan and accomplish goals. Performs a variety of tasks. Works under general supervision and typically reports to a manager. A certain degree of creativity and latitude is required.

II. Employment and Earning Opportunities

A. Education and Training Requirements

Computer maintenance/technical support technician, help desk support, and application/computer support specialist personnel require two years or less of post-secondary education, apprenticeship, specialized training or equivalent work experience. Network administrator, systems administrator, database administrator, and systems operator personnel require at least two years of postsecondary education, apprenticeship, specialized training or equivalent work experience.

B. Employment Opportunities

In Illinois, overall employment of information technology workers is expected to grow faster than average through the year 2008. Many information technology occupations are listed on the 50 fastest growing occupations in the state and should provide ample employment opportunities in the future.

C. Earnings Opportunities

	Middle Range Annual Earnings, 2000*	
Help Desk Support	$32,392-42,055	[2]
Computer Maintenance/Technical Support Technician	$33,365-42,763	[2]
System Operator	$37,997-46,485	[2]
Application/Computer Support Specialist	$30,763-50,960	[1]
Systems Administrator	$44,316-53,790	[2]
Network Administrator	$44,566-61,287	[2]
Database Administrator	$35,525-74,360	[1]

** Middle range is the middle 50%, i.e., one-fourth of persons in the occupation earn below the bottom of the range and one-fourth of persons in the occupation earn above the top of the range.*

Sources: [1] *Occupational Employment Statistics: Wage Data*, Illinois Department of Employment Security, Economic Information and Analysis Division. [2] Salary.com, these numbers are based on the national average adjusted by geographic salary differentials to Bloomington, Illinois as of July 22, 2001.

III. Assessment and Credentialing Systems

The IOSSCC recognizes that industry commitment for third-party assessment is beneficial and requests that each Standards Development Committee (SDC) and/or Subcouncil identifies the most beneficial method for assessing standards.

Several existing industry credentials are compatible with the Illinois Occupational Skill Standards. As a core, achievement of the Illinois skills standards is preparation for those credentials that require work experience, professional development and/or course work. Advanced credentials are available through a variety of software and/or hardware vendors (e.g., IBM, Microsoft, Cisco, Novell, A+, etc.). The information technology worker should choose the credentialing agency most appropriate to the employer's needs in a particular position.

IV. Industry Support and Commitment

A. Industry Commitment for Development and Updating

1. The Communications Subcouncil and the Information Technology Operate Cluster Standards Development Committee developed these performance skill standards. The development effort utilized the following steps:
   a. Identification of performance skills
   b. Review of resources
   c. Development of draft performance skills
   d. Convening of standards development committee
   e. Validation and approval of performance skills by standards development committee
   f. Review of skill standards by standards development committee
   g. Review and approval of the skill standards by the Communications Subcouncil and practitioners
   h. Endorsement of skill standards by IOSSCC
2. A list of members of the Communications Subcouncil and Information Technology Cluster Standards Development Committee are located in Appendix.

B. Industry Commitment for Marketing

The Communications Subcouncil is committed to marketing and obtaining support and endorsement from the leading industry associations impacted by the skill standards. Upon recognition/endorsement of the Information Technology Cluster skill standards by the IOSSCC, the subcouncil strongly recommends developing and providing an in-service/seminar package for its members to provide awareness and obtain full industry commitment to the development of a full industry marketing plan.

The Communications Subcouncil encourages the availability of occupational skill standards to the public, including students, parents, workers, educators at all levels, employers and industry organizations.

ASSUMPTIONS FOR INFORMATION TECHNOLODY OPERATE CLUSTER SKILL STANDARDS

Skill standards assume that individuals have received education and/or training in a setting such as a secondary, postsecondary and/or apprenticeship/on-the-job training program and have the background knowledge necessary for performing the skill standards contained in this publication. The education and/or training includes instruction for the proper handling and operation of materials, tools and equipment required for performing the skills including the purpose of use, when to use, how to use and any related safety issues.

The instructional/training program must adhere to all local, state and federal licensing and/or certification requirements as set by law, if applicable.

The Standards Development Committee developed these skill standards based on the following assumptions:

1. Workplace skills (employability skills) are expected of all individuals. Socialization skills needed for work are related to lifelong career experience and are not solely a part of the initial schooling process. These are not included with this set of statements.
2. The ability to work with numbers and to communicate clearly, concisely and legibly to team members and management are expected of all individuals.
3. Specific policies and procedures of the worksite will be made known to the individual and will be followed.
4. Time elements outlined for the skill standards result from the experience and consideration of the panel of experts who made up the standards development committee.
5. Skills will progress from simple to complex. Once a skill has been successfully performed, it will be incorporated into more complex skills.
6. Skill standards describe the skill only and do not detail the background knowledge or theory related to the particular skill base. Although the skill standard enumerates steps to successful demonstration, rote approaches to the outcomes are not prescribed.
7. Skill standards do not replace, supersede or substitute for procedures manuals.

PERFORMANCE SKILL LEVELS

	Help Desk Support	Computer Maintenance/ Technical Support Technician	Systems Operator	Application Computer Support Specialist	Systems Administrator	Network Administrator	Database Administrator
MONITORING							
Develop Customer Service Level Plan	•	•	•	•	•	•	•
Comply with Service Level Agreement	•	•	•	•	•	•	•
Identify Scope of Abnormal System Performance	•	•	•	•	•	•	•
Identify Scope of Security Problems	•	•	•	•	•	•	•
Identify External Environmental Problems	•	•	•	•	•	•	•
Manage Working Relationships with Customers	•	•	•	•	•	•	•
Manage Multiple Customer Requirements	•	•	•	•	•	•	•
Act as Liaison Between Groups		•	•	•	•	•	•
ADMINISTRATION							
Document Problems	•	•	•	•			
Maintain User Accounts on Multiple Systems		•	•	•	•	•	
Format Data		•	•	•	•	•	
Perform Data Analysis	•	•	•	•	•	•	•
Manage Inventory and Assets	•	•		•	•	•	•
Ensure Recoverability of Systems and Services	•	•		•	•	•	•
Maintain System Documentation	•	•	•	•	•	•	•
Review Internal Systems Audit Procedures					•	•	•
Implement Security Procedures	•				•	•	•
CHANGE MANAGEMENT							
Estimate Impact of Change Request		•		•	•	•	
Implement or Revise Processes/Products					•	•	
OPERATIONS							
Install and Configure Software				•			
Perform System Backup Procedures				•			
Initiate and Control Production Applications				•			
Perform Routine Maintenance				•			
Recommend New Features or Enhancements				•			
Write System Software Evaluation Report				•			
Shut Down Systems	•	•	•		•	•	
MAINTENANCE							
Prepare Backup Plan/Procedures	•	•		•	•	•	•
Communicate Changes	•	•		•	•	•	•
Schedule Maintenance with Business Requirements	•	•		•	•	•	•

PERFORMANCE SKILL LEVELS *(Continued)*

	Help Desk Support	Computer Maintenance/ Technical Support Technician	Systems Operator	Application/Computer Support Specialist	Systems Administrator	Network Administrator	Database Administrator
MAINTENANCE *(Continued)*							
Implement Maintenance/Change Request	•	•		•	•	•	•
Develop/Update Preventative maintenance Plans	•	•		•	•	•	•
Perform Preventative maintenance Plan Diagnostics	•	•		•	•	•	•
TASK MANAGEMENT							
Define Scope of Work to Complete Task		•		•	•	•	•
Coordinate Work Processes and Procedures		•		•	•	•	•
Implement Work Processes and Procedures		•		•	•	•	•
Evaluate Work Processes and Procedures		•		•	•	•	•
TROUBLESHOOTING							
Identify Problem/Incident Cause	•	•	•	•	•	•	•
Implement Solution	•	•	•	•	•	•	•
Evaluate Troubleshooting Processes and Outcomes	•	•	•	•	•	•	•

DEVELOP CUSTOMER SERVICE LEVEL AGREEMENT.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Business operational needs (peak times, product cycles, standards and costs, etc.)
Technical support staff
Hardware, software and operating systems
Company policy and procedures

WORK TO BE PERFORMED

Develop customer service level agreement.

PERFORMANCE CRITERIA

Written customer service level agreement is prepared for and presented to the customer according to company policy and procedures.

Time required to complete the skill varies according to the complexity of the customer business operational needs.

PERFORMANCE ELEMENTS

1. Determine customer goals and expectations.
2. Validate goals and expectations with customer.
3. Review customer goals and expectations with technical support staff.
4. Develop written service level agreement.
5. Present agreement to customer.
6. Revise plan as directed by customer.
7. Obtain customer approval of plan.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Customer service level plan is created.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

COMPLY WITH CUSTOMER SERVICE LEVEL AGREEMENT.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Customer service level (CSL) agreement
Hardware, software and operating systems
Company policy and procedures

WORK TO BE PERFORMED

Monitor compliance with CSL agreement.

PERFORMANCE CRITERIA

Acceptable service levels are maintained with the customer according to the CSL agreement.

Time required to complete the skill varies according to CSL requirements.

PERFORMANCE ELEMENTS

1. Review CSL agreement standards.
2. Identify current level of service.
3. Compare current level of service to CSL agreement.
4. Meet with customer periodically to assess performance satisfaction.
5. Take appropriate action for service that does not meet CSL agreement.
6. Recommend changes/enhancements to agreement.
7. Document and distribute to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Customer service level expectations are met.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

IDENTIFY SCOPE OF ABNORMAL SYSTEM PERFORMANCE.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Hardware, software and operating systems
Interoperability requirements
Expected system performance
Company policy and procedures

WORK TO BE PERFORMED

Identify scope of abnormal system performance.

PERFORMANCE CRITERIA

Abnormal system activity is identified and documented accurately and problem escalation procedures are initiated according to company policy and procedures.

Time required to complete the skill varies according to the size and complexity of the system and type of abnormal system performance.

(Example: Fifteen-user system on peer to peer network with external POP server with one user unable to receive email; problem scope is identified in 10 minutes.)

PERFORMANCE ELEMENTS

1. Evaluate system performance.
2. Identify abnormal system performance.
3. Prioritize severity of problem.
4. Analyze operational problems.
5. Document problem and potential causes.
6. Recommend solutions for corrective action (repair, replace or escalate) to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Solutions for abnormal system activity are recommended.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

IDENTIFY SCOPE OF SECURITY PROBLEMS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Documentation and storage tools
- Security tools
- Virus protection software
- Hardware, software and operating systems
- Escalation procedures
- Company policy and procedures

WORK TO BE PERFORMED

Identify scope of security problems.

PERFORMANCE CRITERIA

Security is maintained according to company policy and procedures.

Time required to complete the skill varies according to the complexity of the system and type of security problems.

(Example: Multiple log on attempts by single user exceeding company parameters is identified by security tools; problem scope is identified in 15 minutes.)

PERFORMANCE ELEMENTS

1. Identify potential security problems.
2. Analyze situations.
3. Determine source/type of problem.
4. Identify risks/implications.
5. Recommend solutions for corrective action (repair, replace or escalate) to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

System security is maintained.

PROCESS

All performance elements are numbered to show an appropriate sequence for completing the skill.

IDENTIFY EXTERNAL ENVIRONMENTAL PROBLEMS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

System user problem/complaint
Hardware, software and operating systems
Interoperability requirements
Escalation procedures
Company policy and procedures

WORK TO BE PERFORMED

Identify external environmental problems.

PERFORMANCE CRITERIA

External environmental problems are identified according to company policy.

Time required to complete the skill varies according to the size and complexity of the system.

(Example: Common external environmental problems [e.g. power cord, loose cables, inoperative components, etc.] on a stand-alone PC are identified within 15 minutes.)

PERFORMANCE ELEMENTS

1. Review problem/complaint.
2. Inspect external environmental factors related to complaint (e.g., power cord, loose cables, inoperative components, etc.).
3. Document cause of external environmental problems.
4. Evaluate environmental impact on system.
5. Recommend solutions for corrective action (repair, replace or escalate) to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

External environmental problems are identified and recommendations made.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

MANAGE WORKING RELATIONSHIPS WITH CUSTOMERS.

MONITORING

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Customer service level (CSL) agreement
Hardware, software and operating systems
Company policy and procedures

WORK TO BE PERFORMED

Manage working relationships with customers.

PERFORMANCE CRITERIA

Relationships are managed according to service level agreement.

Time required to complete the skill varies according to the service level agreement.

PERFORMANCE ELEMENTS

1. Monitor levels of customer satisfaction.
2. Obtain feedback/concerns from customers.
3. Take appropriate actions to address customer's concerns.
4. Ensure resolution meets customer's expectations.
5. Update customer file with situation/remedies.
6. Document and distribute documentation to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Relationships with customers are managed to mutual satisfaction.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

MANAGE MULTIPLE CUSTOMER REQUIREMENTS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Customer service level (CSL) agreements
Customer requirements for multiple clients
Resources (e.g., on-line, manuals, etc.)
Hardware, software and operating systems
Department guidelines
Company policy and procedures

WORK TO BE PERFORMED

Manage multiple customer requirements.

PERFORMANCE CRITERIA

Multiple customer requirements are maintained according to CSL agreements.

Time required to complete the skill varies according to CSL agreements.

PERFORMANCE ELEMENTS

1. Review CSL for each customer.
2. Prioritize daily tasks.
3. Identify workload requirements and limitations.
4. Set goals.
5. Prepare schedule.
6. Monitor/adjust task sequence.
7. Address customer's concerns to customer's satisfaction.
8. Communicate status to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Resources are deployed to meet the service level agreements of multiple clients.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

ACT AS LIAISON BETWEEN GROUPS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Groups responsibilities
Hardware, software and operating systems
Business goals
Company policy and procedures

WORK TO BE PERFORMED

Act as liaison between groups.

PERFORMANCE CRITERIA

Groups are informed of issues and changes according to company policy and procedures.

Time required to complete the skill varies according to the responsibilities of the groups.

(Example: Two groups [users for customer service vs. maintenance for required service] needing access to same equipment on 24/7 service; time to negotiate adequate resolution is 48 hours.)

PERFORMANCE ELEMENTS

1. Analyze group dynamics.
2. Identify underlying issues.
3. Compare multiple viewpoints.
4. Offer contrasting viewpoints.
5. Facilitate cooperation/negotiation.
6. Document resolution.
7. Distribute documentation to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Consensus is established between groups.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

DOCUMENT PROBLEMS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Hardware, software and operating systems
Customer service level (CSL) Agreement
Initial problem/complaint
Documentation process
Company policy and procedures

WORK TO BE PERFORMED

Document problems and communicate to appropriate parties.

PERFORMANCE CRITERIA

Problems are documented and communicated according to company policy and procedures.

Time required to complete the skill varies according to the complexity of the problem.

(Example: Fifteen-user system on peer to peer network with external POP server with one user unable to receive email; problem scope is documented in three minutes.)

PERFORMANCE ELEMENTS

1. Verify complaint/problem with user.
2. Investigate problem history.
3. Identify possible solutions/escalation route.
4. Create supporting documentation.
5. Communicate information in language appropriate to audience.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Problems are documented and communicated to appropriate parties.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

MAINTAIN USER ACCOUNTS ON MULTIPLE SYSTEMS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

User account information
Account management tools (security and storage)
Network systems
Hardware, software and operating systems
Company documentation
Company policy and procedures

WORK TO BE PERFORMED

Maintain user accounts on multiple systems.

PERFORMANCE CRITERIA

User accounts are maintained according to company policy and procedures.

Time required to complete the skill varies according to the size and complexity of the user accounts and systems.

(Examples: A single user is added to the system in five minutes. One user exceeds server space quota; time to resolve is 30 minutes.)

PERFORMANCE ELEMENTS

1. Review user account information.
2. Identify required maintenance procedures (e.g., open new account, close old account, troubleshoot account problems, etc).
3. Schedule account maintenance.
4. Complete account maintenance.
5. Document and distribute documentation to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

User accounts are maintained.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Data (incidents)
Data selection tools
Data selection methods
Company policy and procedures

WORK TO BE PERFORMED

Format data.

PERFORMANCE CRITERIA

Data is formatted according to company policy and procedures.

Time required to complete the skill varies according to the type and quantity of data being processed.

(Example: Incidents tracked through phone logs, problem reporting software, etc. [40,000 incidents per month] are selected, reviewed and formatted in two hours.)

PERFORMANCE ELEMENTS

1. Identify required data fields.
2. Select data (incidents).
3. Review for accuracy/completeness.
4. Arrange data into required format
5. Document and distribute to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Data is selected and formatted.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

PERFORM DATA ANALYSIS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Basic statistical analysis (average, trends, etc.)
Formatted data
Analysis tools and methods
Hardware, software and operating systems
Company policy and procedures

WORK TO BE PERFORMED

Perform data analysis.

PERFORMANCE CRITERIA

Data analysis is performed according to company policy and procedures.

Time required to complete the skill varies according to the quantity of the data and complexity of the system.

(Example: Incidents tracked through phone logs, problem reporting software, etc. [40,000 incidents per month] are selected, reviewed and formatted. The top ten incident resolutions are identified and analyzed for further action in two hours.)

PERFORMANCE ELEMENTS

1. Review statistical analysis.
2. Evaluate relevance of data as related to situation.
3. Summarize results and produce insights into system operation.
4. List potential reasons for observed performance.
5. Document areas earmarked for improvement.
6. Distribute documentation to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

System metrics are performed, measured and reported on a regular basis (monthly, weekly, as appropriate).

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

MANAGE INVENTORY AND ASSETS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

System access
Inventory databases
Hardware, software and operating systems
Company policy and procedures

WORK TO BE PERFORMED

Manage software and hardware inventory and assets.

PERFORMANCE CRITERIA

Inventory documentation on system configuration is completed with 100% accuracy.

Time to complete the skill varies according to the hardware/software and configuration.

(Example: New workstation is added to inventory and issued identification number[s] and software licenses are verified in 10 minutes.)

PERFORMANCE ELEMENTS

1. Review hardware and software inventory as well as the following:
   a. Hardware warranties
   b. Software licenses
   c. Product releases' currency
2. Assign asset identification numbers to new hardware and software.
3. Monitor configuration and efficient utilization of assets.
4. Coordinate storage and distribution of inventory and assets.
5. Complete supporting documents.
6. Distribute/file documents according to company procedures.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Inventory documentation on system configuration reflects current settings/equipment.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

System components
Recovery options
Backup options
Network architecture
Hardware, software and operating systems
Company policy and procedures

WORK TO BE PERFORMED

Ensure recoverability of systems and services.

PERFORMANCE CRITERIA

Procedures for recovering systems and services are documented and distributed/filed according to company policy and procedures.

Time to complete the skill varies according to the services required and system size and complexity.

PERFORMANCE ELEMENTS

1. Review recovery and backup options.
2. Analyze system configuration for stability.
3. Verify currency of system backup files.
4. Verify backup files are secure.
5. Ensure recovery options are documented accurately.
6. Distribute/file recovery procedures according to company procedures.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Procedures for recovering systems and services are documented.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

MAINTAIN SYSTEM DOCUMENTATION.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Current system documentation
Vendor/product resources/information
Hardware, software and operating systems
Company policy and procedures

WORK TO BE PERFORMED

Maintain system documentation.

PERFORMANCE CRITERIA

System documentation and updates are maintained according to company policy and procedures.

Time required to complete the skill varies according to the quantity of documentation and complexity of the system.

(Example: System documentation to review and record software revisions, such as annual tax table review for medium to large system, is completed in three hours.)

PERFORMANCE ELEMENTS

1. Review current system documentation.
2. Identify new/revised equipment/resources.
3. Update system documentation.
4. Distribute revised documentation according to company procedures.
5. File revised documentation according to company procedures.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

System documentation and updates are maintained.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

REVIEW INTERNAL SYSTEMS AUDIT PROCEDURES.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

System measurement and monitoring tools
Auditing procedures
Hardware, software and operating system
Company policy and procedures

WORK TO BE PERFORMED

Review internal systems audit procedures.

PERFORMANCE CRITERIA

Internal systems auditing procedures are current and documented with 100% accuracy.

Time to complete the skill varies according to the complexity of the system.

PERFORMANCE ELEMENTS

1. Analyze internal systems audit techniques for accuracy, currency, applicability and usefulness.
2. Recommend revisions to internal systems audit techniques.
3. Document revisions to internal systems audit techniques.
4. Distribute revisions according to company policy and procedures.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Internal systems audit techniques are current and documented.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

IMPLEMENT SECURITY PROCEDURES.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Security procedures (e.g., system backups, virus protection, end-user and operational security)
System security processes and audit procedures
System architecture
Hardware, software and operating systems
Company policy and procedures

WORK TO BE PERFORMED

Implement security procedures.

PERFORMANCE CRITERIA

Security procedures are implemented and distributed according to company policy and procedures.

Time required to complete the skill varies according to the size and complexity of system.

PERFORMANCE ELEMENTS

1. Review current security policies.
2. Identify security risks and exposures.
3. Recommend security measures to address risks and exposures.
4. Update security documentation.
5. Implement revised security measures.
6. Distribute documentation to appropriate parties.
7. File documentation.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Security policies are implemented and distributed to appropriate parties.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

ESTIMATE IMPACT OF CHANGE REQUEST.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

System architecture
Change request (i.e., request for new or upgraded hardware/software)
Hardware, software and operating systems
Company policy and procedures

WORK TO BE PERFORMED

Estimate impact of change request.

PERFORMANCE CRITERIA

Impact of change request is completed and communicated according to company policy and procedures.

Estimates, costs analysis, tradeoffs and possible alternatives within the system are accurate and complete.

Time required to complete the skill varies according to the complexity of the change request.

PERFORMANCE ELEMENTS

1. Analyze current system architecture.
2. Analyze change request.
3. Predict impact of change request on systems.
4. Document recommendation (e.g., estimates, costs analysis, tradeoffs and possible alternatives) on change request.
5. Report recommendations to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Impact of change request is communicated to appropriate parties.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

IMPLEMENT OR REVISE PROCESSES/PRODUCT.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Test methodologies
Quality assurance principles
System architecture
Change request (i.e., request for new or upgraded hardware/software)
Hardware, software and operating systems
Company policy and procedures

WORK TO BE PERFORMED

Implement or revise processes/products based on testing and certification.

PERFORMANCE CRITERIA

Processes/products are implemented or revised according to company policy and procedures.

Time required to complete the skill varies according to the complexity of the system.

PERFORMANCE ELEMENTS

1. Assess accuracy of change request.
2. Analyze current processes/products.
3. Test change request.
4. Identify levels of responsibility for accomplishing change request.
5. Report changes to appropriate individuals.
6. Implement or revise processes/products.
7. Document and distribute changes to appropriate parties.
8. File document according to company procedures.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Processes/products are implemented or revised.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

INSTALL AND CONFIGURE SOFTWARE.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Software installation procedures
Compatibility issues and resolution procedures
Network and operating systems
Vendor procedures
Hardware, software and operating systems
Company policy and procedures

WORK TO BE PERFORMED

Install and configure software.

PERFORMANCE CRITERIA

Software is installed and configured according to company/vendor policy and procedures.

Time required to complete the skill varies according to the size and complexity of the software and configurations.

PERFORMANCE ELEMENTS

1. Evaluate software and system requirements.
2. Compare to existing system requirements.
3. Install and configure new software.
4. Test new software.
5. Troubleshoot and resolve system and software conflicts.
6. Complete documentation.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Software is installed and configured.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

PERFORM SYSTEM BACKUP PROCEDURES.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

System backup procedures
Hardware, software and operating systems
Company policy and procedures

WORK TO BE PERFORMED

Perform system backup procedures.

PERFORMANCE CRITERIA

System backup procedures are completed according to company policy and procedures.

Time required to complete the skill varies according to the size and complexity of the system.

PERFORMANCE ELEMENTS

1. Review backup procedures.
2. Prepare backup software and hardware.
3. Select system backup(s) to be completed.
4. Run backup.
5. Store backup as required.
6. Document and distribute backup log to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

System backups are collected and documented.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

INITIATE AND CONTROL PRODUCTION APPLICATIONS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Production applications requirements/parameters
- Operating environment
- Standard and recovery procedures
- Hardware, software and operating systems
- Company policy and procedures

WORK TO BE PERFORMED

Initiate and control production applications.

PERFORMANCE CRITERIA

Production application requirements are controlled according to company policy and procedures.

Time required to complete the skill varies according to the complexity of the production applications.

PERFORMANCE ELEMENTS

1. Review production applications requirements/parameters.
2. Set parameters for normal operation.
3. Establish reporting mechanisms for abnormal operation.
4. Identify production applications operating outside normal parameters.
5. Identify potential causes for abnormal operation.
6. Take corrective action to restore normal operation.
7. Document abnormal situations and resolutions.
8. Distribute documentation to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Production applications operate properly. Proper recovery from error conditions is consistently maintained.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Diagnostic tools
- Technological results
- Maintenance schedules
- Maintenance manuals
- Documentation
- Hardware, software and operating systems
- Company policy and procedures

WORK TO BE PERFORMED

Perform routine maintenance.

PERFORMANCE CRITERIA

Routine maintenance is performed as scheduled according to company policy and procedures.

Time required to complete the skill varies according to the type of maintenance required.

PERFORMANCE ELEMENTS

1. Review maintenance schedules.
2. Identify areas requiring routine maintenance.
3. Review maintenance procedures.
4. Follow specified maintenance procedures.
5. Run diagnostic checks on all critical components of system.
6. Troubleshoot failures.
7. Document results.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Routine maintenance is performed.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

RECOMMEND NEW FEATURES OR ENHANCEMENTS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

System tools
Company resources and constraints
Hardware, software and operating systems
Company policy and procedures

WORK TO BE PERFORMED

Recommend new features or enhancements to existing tools.

PERFORMANCE CRITERIA

New features or enhancements are recommended to improve existing processes.

Time required to complete the skill varies according to the size and complexity of the system.

PERFORMANCE ELEMENTS

1. Analyze current system performance.
2. Evaluate impact of system upgrade.
3. Prepare implementation action plan.
4. Justify modification.
5. Document recommendations.
6. Distribute documentation to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Recommendations result in improving existing processes.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

WRITE SYSTEM SOFTWARE EVALUATION REPORT.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Performance data
Problem logs/records
Software operations specifications
System specifications
Hardware, software and operating systems
Company policy and procedures

WORK TO BE PERFORMED

Write system software evaluation report.

PERFORMANCE CRITERIA

System software evaluation is completed according to company policy and procedures.

Time required to complete the skill varies according to the size and complexity of the system.

PERFORMANCE ELEMENTS

1. Review existing supporting documents (performance data, problem logs, etc.).
2. Analyze information.
3. Update/create supporting documents.
4. Recommend software improvements.
5. Complete system evaluation report.
6. Distribute software evaluation report to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Software evaluation report is completed.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

SHUT DOWN SYSTEMS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Shutdown procedures
- Vendor procedures
- System architecture
- System configuration
- Company policy and procedures

WORK TO BE PERFORMED

Shut down systems.

PERFORMANCE CRITERIA

System shutdown is performed according to shutdown procedures.

Time required to complete the skill varies according to the size and complexity of the system.

PERFORMANCE ELEMENTS

1. Ensure all users are off the system.
2. Ensure required backups have been performed.
3. Inspect system for potential problems during start-up.
4. Perform shutdown procedures.
5. Document required information.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

System is shut down.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

PREPARE BACKUP PLAN/PROCEDURES.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Backup procedures
Appropriate financial and system integrity risks
Identified system interdependencies
Hardware, software and operating systems
Company policy and procedures

WORK TO BE PERFORMED

Prepare backup plan/procedures.

PERFORMANCE CRITERIA

Backup procedures/processes are tested and verified according to company policy and procedures.

Time required to complete the skill varies according to the size and complexity of the system.

Time to perform steps two through four is approximately 90 minutes.

PERFORMANCE ELEMENTS

1. Review existing backup procedures.
2. Evaluate system backup configuration/stability.
3. Identify risks and implications.
4. Examine data and results.
5. Recommend plan of action.
6. Document and distribute documentation to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Backup procedures are audited.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

COMMUNICATE CHANGES.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Change management processes
Organizational structure
Network architecture
Hardware, software and operating systems
Company policy and procedures

WORK TO BE PERFORMED

Communicate changes to appropriate work groups.

PERFORMANCE CRITERIA

Changes are communicated according to company policy and procedures.

Time required to complete the skill varies according to the complexity of the changes.

PERFORMANCE ELEMENTS

1. Review recommended changes.
2. Review system capabilities.
3. Organize change requirements and impacts.
4. Document and distribute documentation to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Change request documentation is completed and distributed to appropriate parties.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

SCHEDULE MAINTENANCE WITH BUSINESS REQUIREMENTS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Maintenance tools
- Change/maintenance request
- Customer service level agreement (CSL)
- Business requirements
- Network and operating system environments
- Company policy and procedures

WORK TO BE PERFORMED

Schedule requested maintenance to provide minimum interruption of business requirements.

PERFORMANCE CRITERIA

Requested maintenance is scheduled according to company policy and procedures.

Time required to complete the skill is one hour.

PERFORMANCE ELEMENTS

1. Review business requirements.
2. Review change/maintenance request.
3. Review customer service level agreement.
4. Identify required personnel versus availability.
5. Schedule timeline for completing request.
6. Document maintenance schedule.
7. Distribute documentation to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Maintenance schedule is communicated to appropriate parties.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

IMPLEMENT MAINTENANCE/CHANGE REQUEST.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Upgrade and installation procedures
Data conversion issues and procedures
Maintenance/change request
Maintenance schedule
Compatibility issues and resolution procedures
Network architecture
Hardware, software and operating systems
Company policy and procedures

WORK TO BE PERFORMED

Implement maintenance/change request.

PERFORMANCE CRITERIA

Maintenance/change request is completed according to maintenance schedule and company policy and procedures.

Time required to complete the skill varies according to the scope and complexity of the system and change request.

PERFORMANCE ELEMENTS

1. Review maintenance/change request and schedule.
2. Evaluate system configuration/stability.
3. Implement technological improvements/changes.
4. Reevaluate system configuration/stability.
5. Document completion of change.
6. Distribute and store documentation.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Maintenance/change request is implemented.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

DEVELOP/UPDATE PREVENTATIVE MAINTENANCE PLANS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Vendor recommended maintenance
Service level/maintenance agreement
System requirements
Hardware, software and operating systems
Company policy and procedures

WORK TO BE PERFORMED

Develop/update preventative maintenance plans.

PERFORMANCE CRITERIA

Preventative maintenance plans are developed/updated according to company policy and procedures.

Time required to complete the skill varies according to the complexity of the system. Preventative maintenance plans are developed/updated according to company policy and procedures.

PERFORMANCE ELEMENTS

1. Review vendor recommendations.
2. Review service level agreements.
3. Review and document level of system activity.
4. Review current maintenance plan.
5. Recommend additional needs for preventative maintenance plan.
6. Test revised plan.
7. Document and distribute plan to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Preventative maintenance plan is developed/updated and communicated to appropriate parties.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

PERFORM PREVENTATIVE MAINTENANCE PLAN DIAGNOSTICS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Diagnostic procedures and processes
- Diagnostic tools
- Diagnostic schedule
- Preventative maintenance plan
- Expected results
- Monitoring feedback
- Online resources
- Hardware, software and operating systems
- Company policy and procedures

WORK TO BE PERFORMED

Perform preventative maintenance plan diagnostics.

PERFORMANCE CRITERIA

Preventative maintenance plan diagnostics is executed according to company policy and procedures and diagnostic schedule.

Time required to complete the skill varies according to the scope and complexity of the diagnoses being performed.

PERFORMANCE ELEMENTS

1. Review maintenance plan/diagnostic schedule.
2. Run diagnostic tools.
3. Compare outcome to expected results.
4. Document recommended diagnostic changes.
5. Distribute recommendations to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Preventative maintenance plan diagnostics are completed.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

DEFINE SCOPE OF WORK TO COMPLETE TASK.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Task timeline
- Task and related task objectives
- Time management strategy
- Applicable standards, regulations and laws
- Hardware, software and operating systems
- Company policy and procedures

WORK TO BE PERFORMED

Define scope of work to complete task.

PERFORMANCE CRITERIA

Specifics of the task are identified and communicated.

Time required to complete the skill varies according to the size and complexity of the task.

PERFORMANCE ELEMENTS

1. Review task, objectives and timeline.
2. Formulate an activity plan (step sequence).
3. Predict outcomes/results based on experience or prior knowledge.
4. Develop time plan for task.
5. Assign personnel responsibilities for activity plan.
6. Document recommendations and distribute to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Specifics of the task are identified and coordinated with the team.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

COORDINATE WORK PROCESSES AND PROCEDURES.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Time and activity plan
Forecast tools and resources
Material request procedures
Hardware, software and operating systems
Company policy and procedures

WORK TO BE PERFORMED

Coordinate work processes and procedures.

PERFORMANCE CRITERIA

Work processes or procedures are coordinated according to company policy and procedures.

Time required to complete the skill varies according to the size and complexity of the task.

PERFORMANCE ELEMENTS

1. Review time and activity plan.
2. Obtain required tools and resources.
3. Communicate work assignments to appropriate parties.
4. Distribute tools and resources to appropriate parties..
5. Document steps and projected completion times.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Work processes and procedures are coordinated.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

IMPLEMENT WORK PROCESSES AND PROCEDURES.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Work processes and procedures
Time and activity plan
Forecast tools and resources
Hardware, software and operating systems
Company policy and procedures

WORK TO BE PERFORMED

Implement work processes and procedures.

PERFORMANCE CRITERIA

Implementation is completed according to company policy and procedures.

Time required to complete the skill varies according to the size and complexity of the task.

PERFORMANCE ELEMENTS

1. Review time and activity plan and work processes and procedures.
2. Ensure all team members are ready and have the required tools and resources.
3. Monitor task completion.
4. Resolve issues.
5. Document task completion.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Work processes and procedures are implemented.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

EVALUATE WORK PROCESSES AND PROCEDURES.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Standard evaluation systems
Work processes and procedures
Time and activity plan
Hardware, software and operating systems
Company policy and procedures

WORK TO BE PERFORMED

Evaluate work processes and procedures.

PERFORMANCE CRITERIA

Work processes and procedures are evaluated according to company policy and procedures.

Time required to complete the skill varies according to the size and complexity of the work processes and procedures.

PERFORMANCE ELEMENTS

1. Review time and activity plans, and work processes and procedures.
2. Evaluate quality of work performed.
3. Evaluate time spent on task.
4. Suggest improvements to the process.
5. Recommend changes to training, documentation, preparation, policy, etc.
6. Complete task status report.
7. Distribute and store report.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Task status report is completed.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

IDENTIFY PROBLEM/INCIDENT CAUSE.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Problem definition
Incident logs
Diagnostic tools and procedures
History of known problems
Hardware, software and operating systems
Company policy and procedures

WORK TO BE PERFORMED

Identify cause of system problem/incidents.

PERFORMANCE CRITERIA

Cause of system problems/incidents are identified according to company policy and procedures.

Time varies according to the system problem/incident and the diagnostic tests required.

PERFORMANCE ELEMENTS

1. Review problem/incident information.
2. Review incident logs for similar occurrences.
3. Assess problem/incident with diagnostic tools and procedures.
4. Determine scope of problem.
5. Document cause of problem/incident and plan of action.
6. Communicate results to appropriate individuals.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Cause of problem/incident is identified and documented.

PROCESS

All performance elements for identifying cause f problem/incident are critical.

IMPLEMENT SOLUTION.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Problem definition
- Problem cause documentation
- Incident logs
- Diagnostic tools and procedures
- History of known problems
- Hardware, software and operating systems
- Company policy and procedures

WORK TO BE PERFORMED

Implement problem resolution.

PERFORMANCE CRITERIA

Problem resolution is implemented according to company policy and procedures.

Time required to complete the skill varies according to the size and complexity of the problem and system.

PERFORMANCE ELEMENTS

1. Review problem/incident cause documentation.
2. Review incident logs against current problem.
3. Identify potential solutions.
4. Test and evaluate potential solutions.
5. Identify most effective resolution.
6. Implement resolution.
7. Document and communicate results to appropriate parties.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Resolution is implemented and problem/incident corrected.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

EVALUATE TROUBLESHOOTING PROCESSES AND OUTCOMES.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

Problem definition
Problem cause documentation
Problem cause resolution
Previous troubleshooting evaluations
Standard evaluation systems
Hardware, software and operating systems
Company policy and procedures

WORK TO BE PERFORMED

Evaluate troubleshooting processes and outcomes.

PERFORMANCE CRITERIA

Evaluation of the troubleshooting processes is completed according to company policy and procedures.

Time required to complete the skill varies according to the feedback required.

PERFORMANCE ELEMENTS

1. Review problem definition, problem cause documentation and resolution.
2. Review processes followed.
3. Compare to previous troubleshooting evaluations.
4. List possible improvements to the process.
5. Recommend changes to training, documentation, policy, etc.
6. Complete evaluation report.
7. Distribute and store report.

PERFORMANCE ASSESSMENT CRITERIA

PRODUCT

Evaluation of troubleshooting processes is completed.

PROCESS

The performance elements are numbered to show an appropriate sequence for completing the skill.

Network and Online Resources	Resources for product development that include, but are not limited to, the intranet, internet, LAN, etc.
Physical Requirements	The space allocation requirements that are necessary to host/house proposed new equipment.
System Requirements	The technical specifications required by the proposed hardware and/or software to properly communicate with the existing system.
System Development Life Cycle (SDLC)	The methodology used for project planning, development, implementation and support of system projects. The methodology phases include: define requirements, design, build, test and implement.
Human Factors	Identification of symbols, use of colors, language, etc. that is widely recognizable and not offensive or insulting to end users.
Usability Factors	The features, requirements, etc. as specified by the client and/or team members for the implementation and/or use of new hardware/software.
Team Members	Includes all parties involved in the project (e.g., client, staff, other divisions, etc.)
Multimedia	Computer-based technologies such as full motion video, animation and high-quality images that are used to create, integrate and present electronic information beyond the conventional text and graphic formats.

APPENDIX B — GLOSSARY OF TERMS

Academic Skills	Skills (and related knowledge) contained in the subject areas and disciplines addressed in most national and state educational standards, including English, mathematics, science, etc.
Assessment	A process of measuring performance against a set of standards through examinations, practical tests, performance observations and/or the completion of work portfolios.
Content Standard	A specification of what someone should know or be able to do to successfully perform a work activity or demonstrate a skill.
Critical Work Functions	Distinct and economically meaningful sets of work activities critical to a work process or business unit which are performed to achieve a given work objective with work outputs that have definable performance criteria. A critical work function has three major components: • **Conditions of Performance:** The information, tools, equipment and other resources provided to a person for a work performance. • **Work to Be Performed:** A description of the work to be performed. • **Performance Criteria:** The criteria used to determine the required level of performance. These criteria could include product characteristics (e.g., accuracy levels, appearance, etc.), process or procedure requirements (e.g., safety, standard professional procedures, etc.) and time and resource requirements. The IOSSCC requires that these performance criteria be further specified by more detailed individual performance elements and assessment criteria.
Credentialing	The provision of a certificate or award to an individual indicating the attainment of a designated set of knowledge and skills and/or the demonstration of a set of critical work functions for an industry/occupational area.
Illinois Occupational Skill Standards and Credentialing Council (IOSSCC)	Legislated body representing business and industry which establishes skill standards criteria, endorses final products approved by the industry subcouncil and standards development committee and assists in marketing and dissemination of occupational skill standards.
Industry	Type of economic activity, or product or service produced or provided in a physical location (employer establishment). They are usually defined in terms of the Standard Industrial Classification (SIC) system.

Industry Subcouncil	Representatives from business/industry and education responsible for identifying and prioritizing occupations for which occupational performance skill standards are adapted, adopted or developed. They establish standards development committees and submit developed skill standards to the IOSSCC for endorsement. They design marketing plans and promote endorsed skill standards across the industry.
Knowledge	Understanding the facts, principles, processes, methods and techniques related to a particular subject area, occupation or industry.
Occupation	A group or cluster of jobs, sharing a common set of work functions and tasks, work products/services and/or worker characteristics. Occupations are generally defined in terms of a national classification system including the Standard Occupational Classification (SOC), Occupational Employment Statistics (OES) and the Dictionary of Occupational Titles (DOT).
Occupational Cluster	Grouping of occupations from one or more industries that share common skill requirements.
Occupational Skill Standards	Specifications of content and performance standards for critical work functions or activities and the underlying academic, workplace and occupational knowledge and skills needed for an occupation or an industry/occupational area.
Occupational Skills	Technical skills (and related knowledge) required to perform the work functions and activities within an occupation.
Performance Standard	A specification of the criteria used to judge the successful performance of a work activity or the demonstration of a skill.
Product Developer	Individual contracted to work with the standard development committee, state liaison, industry subcouncil and IOSSCC for the adaptation, adoption or development of skill standards content.
Reliability	The degree of precision or error in an assessment system so repeated measurements yield consistent results.

Skill	A combination of perceptual, motor, manual, intellectual and social abilities used to perform a work activity.
Skill Standard	Statement that specifies the knowledge and competencies required to perform successfully in the workplace.
Standards Development Committee	Incumbent workers, supervisors and human resource persons within the industry who perform the skills for which standards are being developed. Secondary and postsecondary educators are also represented on the committee. They identify and verify occupational skill standards and assessment mechanisms and recommend products to the industry subcouncil for approval.
State Liaison	Individual responsible for communicating information among all parties (e.g., IOSSCC, subcouncil, standard development committee, product developer, project director, etc.) in skill standard development.
Third-Party Assessment	An assessment system in which an industry-designated organization (other than the training provider) administers and controls the assessment process to ensure objectivity and consistency. The training provider could be directly involved in the assessment process under the direction and control of a third-party organization.
Validity	The degree of correspondence between performance in the assessment system and job performance.
Workplace Skills	The generic skills essential to seeking, obtaining, keeping and advancing in any job. These skills are related to the performance of critical work functions across a wide variety of industries and occupations including problem solving, leadership, teamwork, etc.

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APPENDIX E

INFORMATION TECHNOLOGY OPERATE CLUSTER STANDARDS DEVELOPMENT COMMITTEE

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Jim Wright	State Farm – Bloomington, IL
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Ron Engstrom	State Liaison Illinois State Board of Education

A. Developing an Employment Plan	1.	Match interests to employment area.
	2.	Match aptitudes to employment area.
	3.	Identify short-term work goals.
	4.	Match attitudes to job area.
	5.	Match personality type to job area.
	6.	Match physical capabilities to job area.
	7.	Identify career information from counseling sources.
	8.	Demonstrate a drug-free status.
B. Seeking and Applying for Employment Opportunities	1.	Locate employment opportunities.
	2.	Identify job requirements.
	3.	Locate resources for finding employment.
	4.	Prepare a resume.
	5.	Prepare for job interview.
	6.	Identify conditions for employment.
	7.	Evaluate job opportunities.
	8.	Identify steps in applying for a job.
	9.	Write job application letter.
	10.	Write interview follow-up letter.
	11.	Complete job application form.
	12.	Identify attire for job interview.
C. Accepting Employment	1.	Apply for social security number.
	2.	Complete state and federal tax forms.
	3.	Accept or reject employment offer.
	4.	Complete employee's Withholding Allowance Certificate Form W-4.
D. Communicating on the Job	1.	Communicate orally with others.
	2.	Use telephone etiquette.
	3.	Interpret the use of body language.
	4.	Prepare written communication.
	5.	Follow written directions.
	6.	Ask questions about tasks.
E. Interpreting the Economics of Work	1.	Identify the role of business in the economic system.
	2.	Describe responsibilities of employee.
	3.	Describe responsibilities of employer or management.
	4.	Investigate opportunities and options for business ownership.
	5.	Assess entrepreneurship skills.
F. Maintaining Professionalism	1.	Participate in employment orientation.
	2.	Assess business image, products and/or services.
	3.	Identify positive behavior.
	4.	Identify company dress and appearance standards.
	5.	Participate in meetings in a positive and constructive manner.
	6.	Identify work-related terminology.
	7.	Identify how to treat people with respect.

G. Adapting to and Coping with Change	1.	Identify elements of job transition.
	2.	Formulate a transition plan.
	3.	Identify implementation procedures for a transition plan.
	4.	Evaluate the transition plan.
	5.	Exhibit ability to handle stress.
	6.	Recognize need to change or quit a job.
	7.	Write a letter of resignation.
H. Solving Problems and Critical Thinking	1.	Identify the problem.
	2.	Clarify purposes and goals.
	3.	Identify solutions to a problem and their impact.
	4.	Employ reasoning skills.
	5.	Evaluate options.
	6.	Set priorities.
	7.	Select and implement a solution to a problem.
	8.	Evaluate results of implemented option.
	9.	Organize workloads.
	10.	Assess employer and employee responsibility in solving a problem.
I. Maintaining a Safe and Healthy Work Environment	1.	Identify safety and health rules/procedures.
	2.	Demonstrate the knowledge of equipment in the workplace.
	3.	Identify conservation and environmental practices and policies.
	4.	Act during emergencies.
	5.	Maintain work area.
	6.	Identify hazardous substances in the workplace.
J. Demonstrating Work Ethics and Behavior	1.	Identify established rules, regulations and policies.
	2.	Practice cost effectiveness.
	3.	Practice time management.
	4.	Assume responsibility for decisions and actions.
	5.	Exhibit pride.
	6.	Display initiative.
	7.	Display assertiveness.
	8.	Demonstrate a willingness to learn.
	9.	Identify the value of maintaining regular attendance.
	10.	Apply ethical reasoning.
K. Demonstrating Technological Literacy	1.	Demonstrate basic keyboarding skills.
	2.	Demonstrate basic knowledge of computing.
	3.	Recognize impact of technological changes on tasks and people.
L. Maintaining Interpersonal Relationships	1.	Value individual diversity.
	2.	Respond to praise or criticism.
	3.	Provide constructive praise or criticism.
	4.	Channel and control emotional reactions.
	5.	Resolve conflicts.
	6.	Display a positive attitude.
	7.	Identify and react to sexual intimidation/harassment.
M. Demonstrating Teamwork	1.	Identify style of leadership used in teamwork.
	2.	Match team member skills and group activity.
	3.	Work with team members.
	4.	Complete a team task.
	5.	Evaluate outcomes.

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